

FIGURE 1

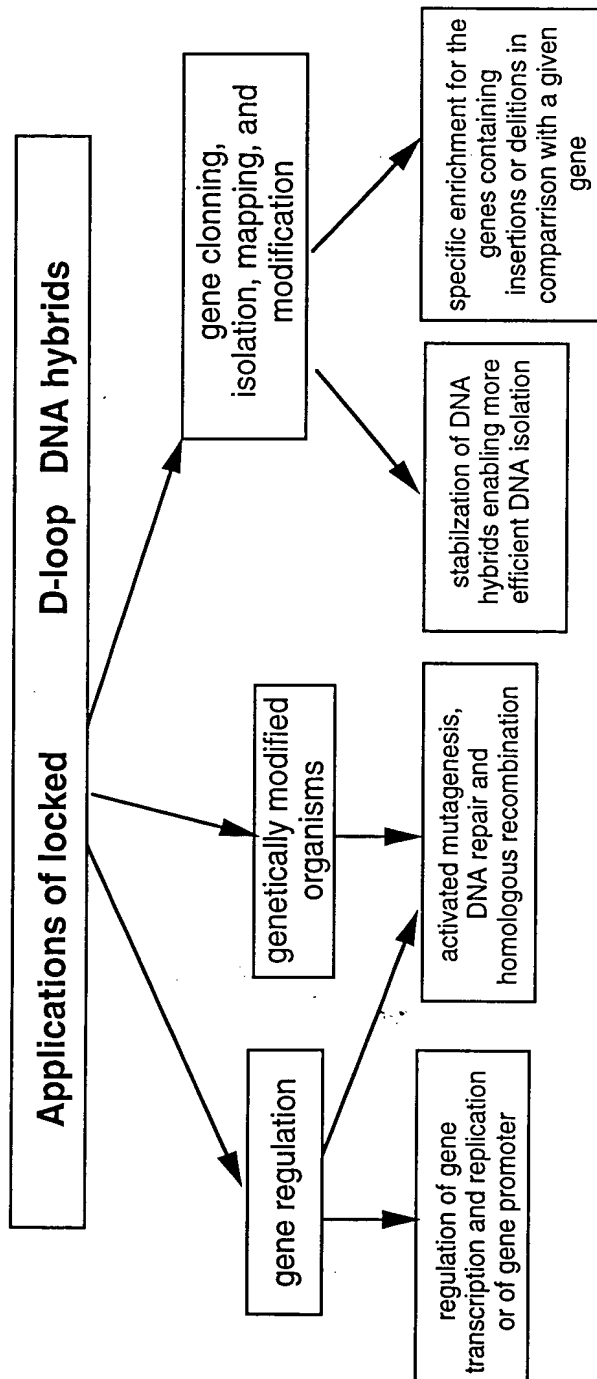
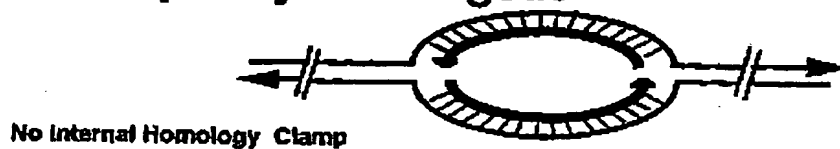


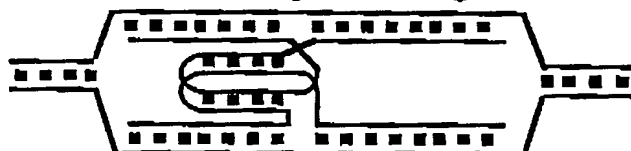
FIGURE 2

A Target DNA completely homologous



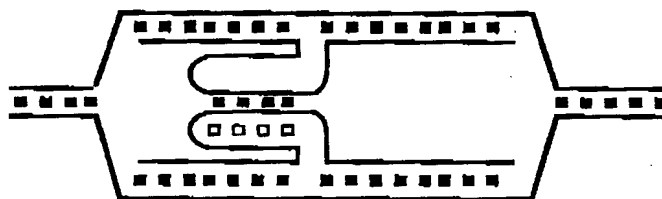
B duplex-forming heterologous insert

B



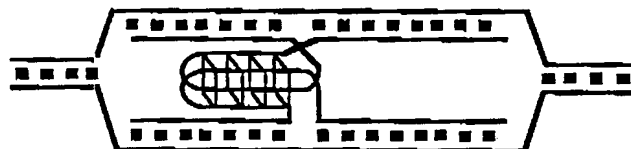
C triplex-forming heterologous insert

C



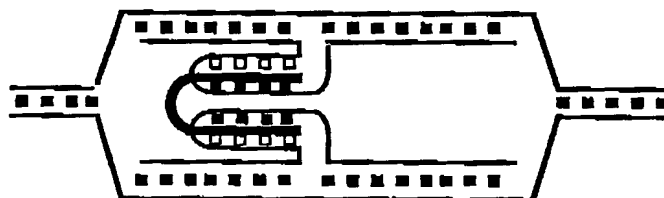
D quadruplex-forming heterologous insert

D



E homologous insert which forms triplex with secondary probe

E



F Target DNA with an insertion

F

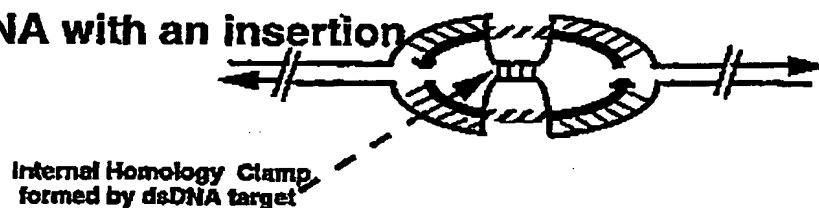
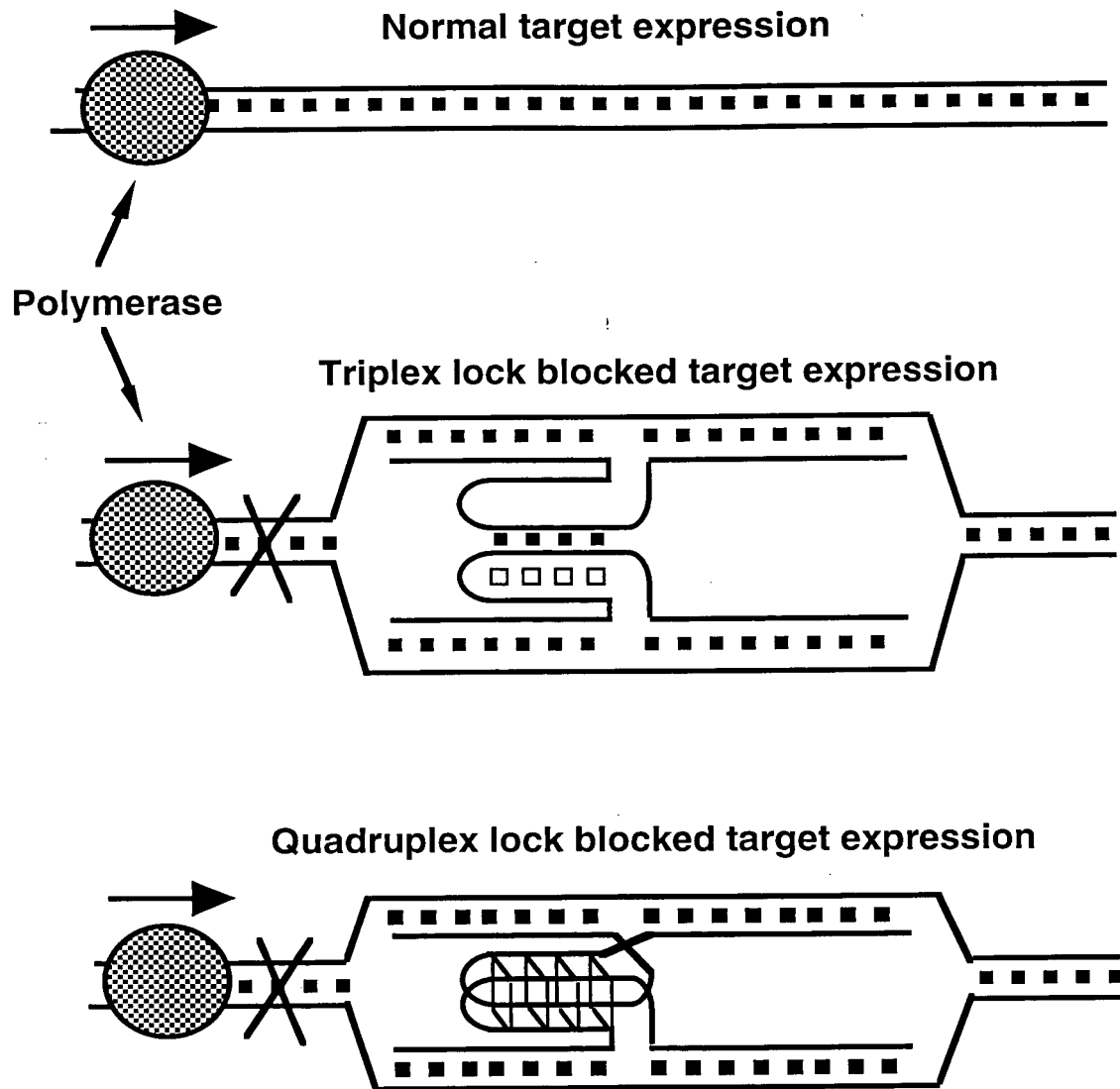
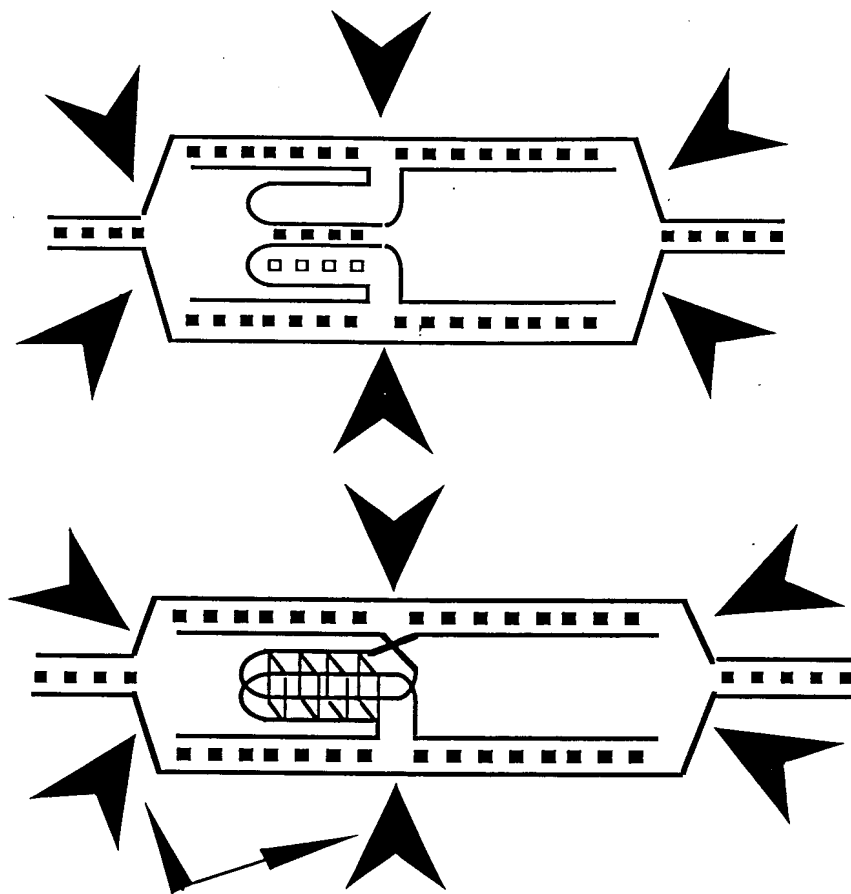


FIGURE 3



001240" E2425960

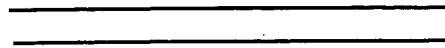
FIGURE 4



Hybrid recognition by
nucleic acid repair,
nucleic acid recombination,
and resolution enzymes

FIGURE 5

cssDNA probes



+

+

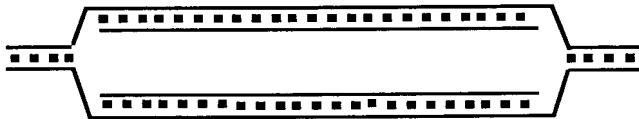


completely homologous DNA
target without deletions

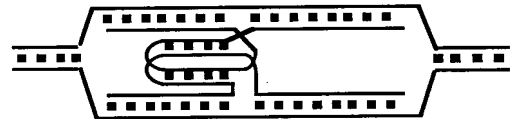


target with deletion (shown as dashed)

hybrid formation



double D-loop without duplex DNA lock



double D-loop with the duplex DNA lock

moderate heat treatment

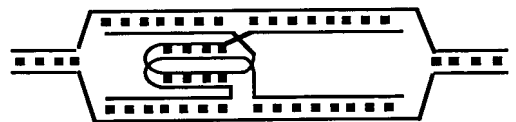


intact DNA target

+



DNA duplex formed by
cssDNA probes



intact double D-loop hybrid

00T240" E2425560

FIGURE 6

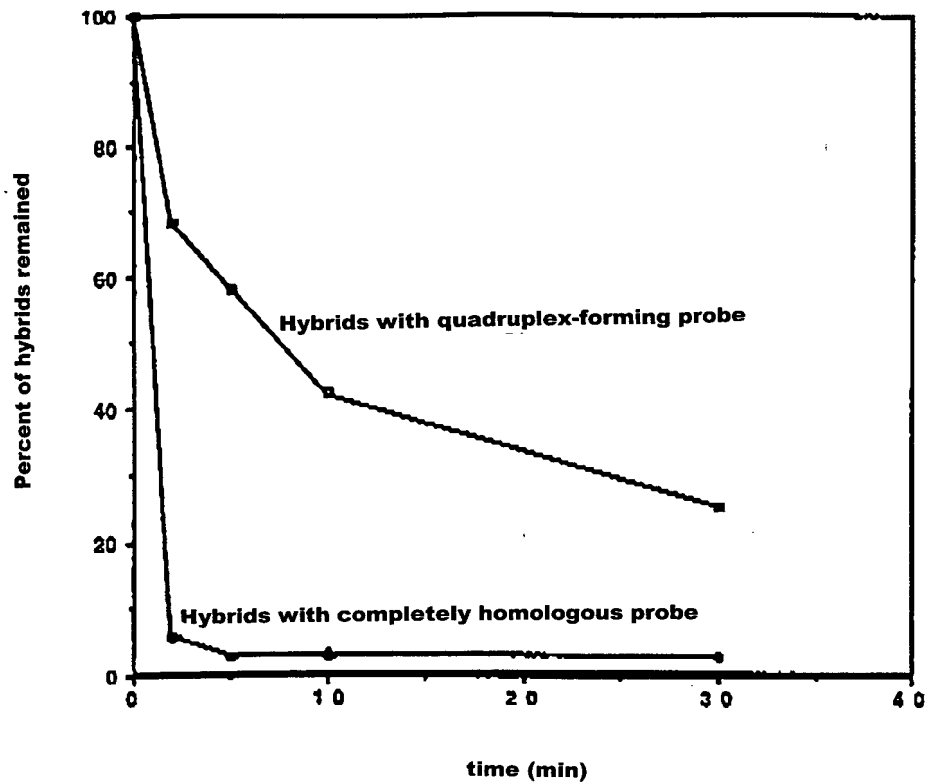


FIGURE 7

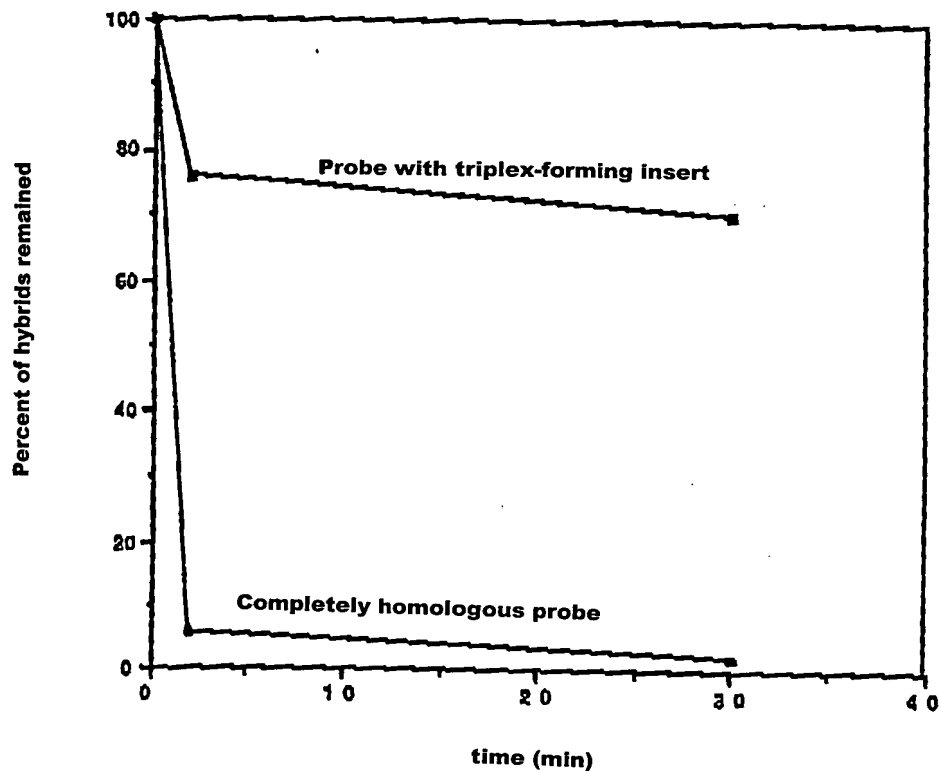
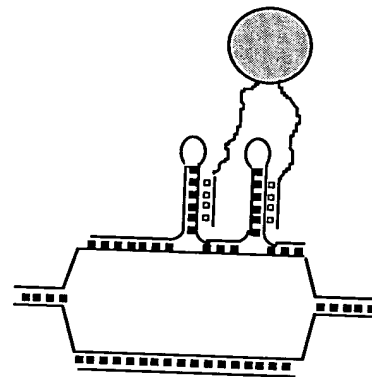
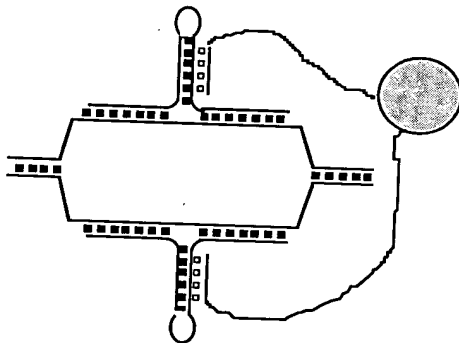
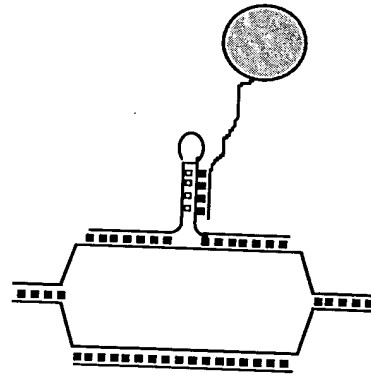
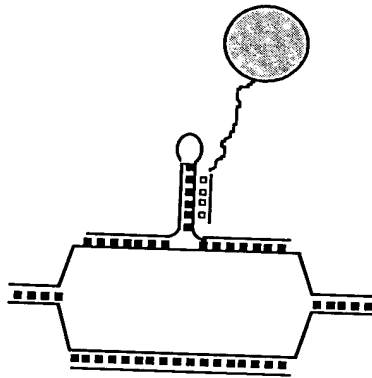


FIGURE 8A



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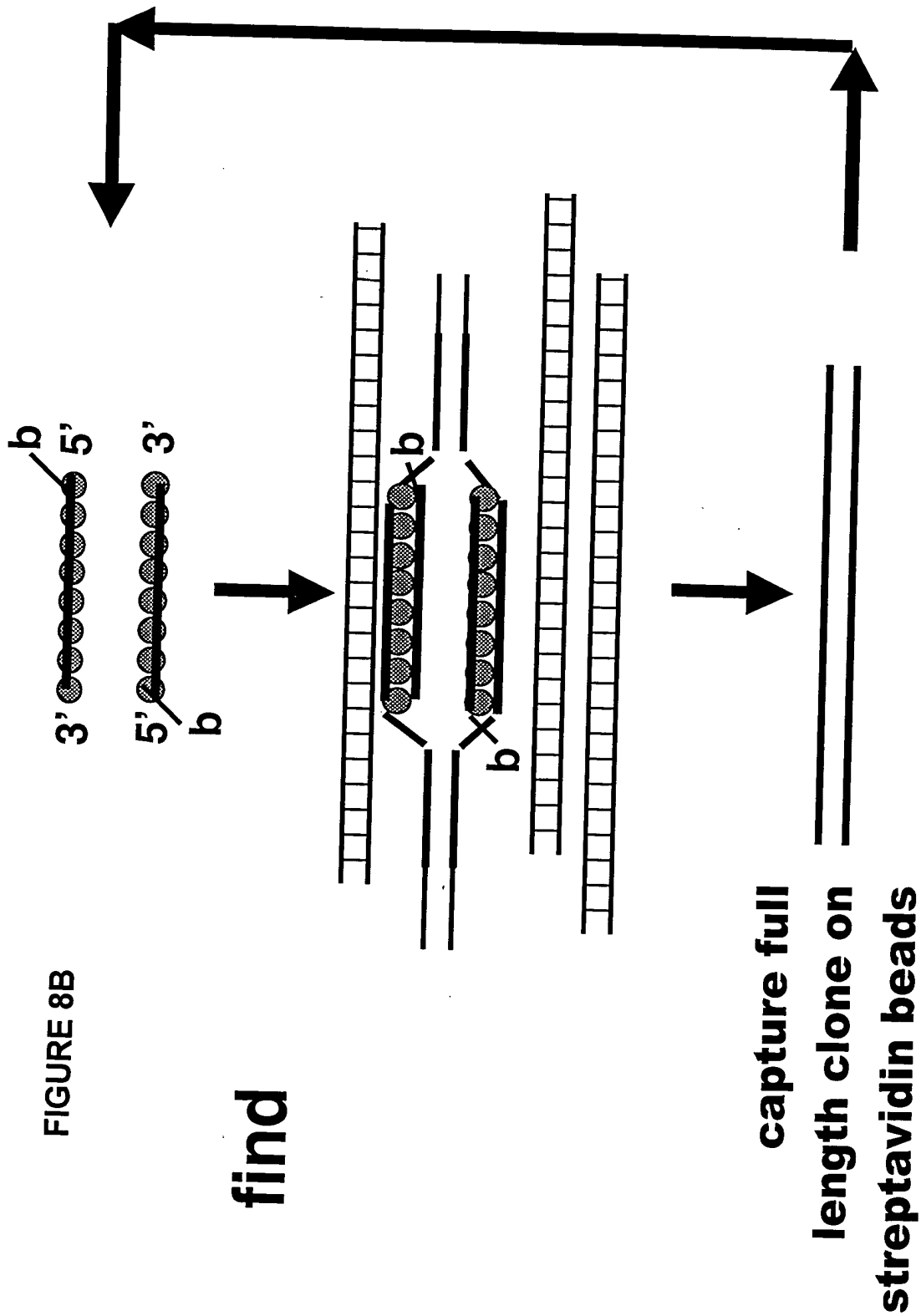
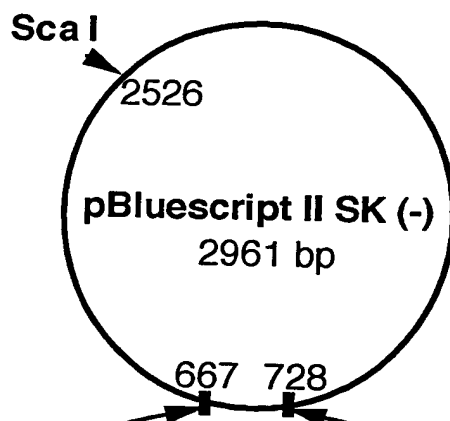


FIGURE 9



A.

5' - CCTCGAGGTCGACGGTATCGATAAGCTTGATATCGAATTCCTGCAGCCCGGGGGATCCACTA - 3' **NI_w**
3' - GGAGCTCCAGCTGCCATAGCTATTCGAACTATAGCTTAAGGACGTCGGGCCCCCTAGGTGAT - b **NI_c**

B.

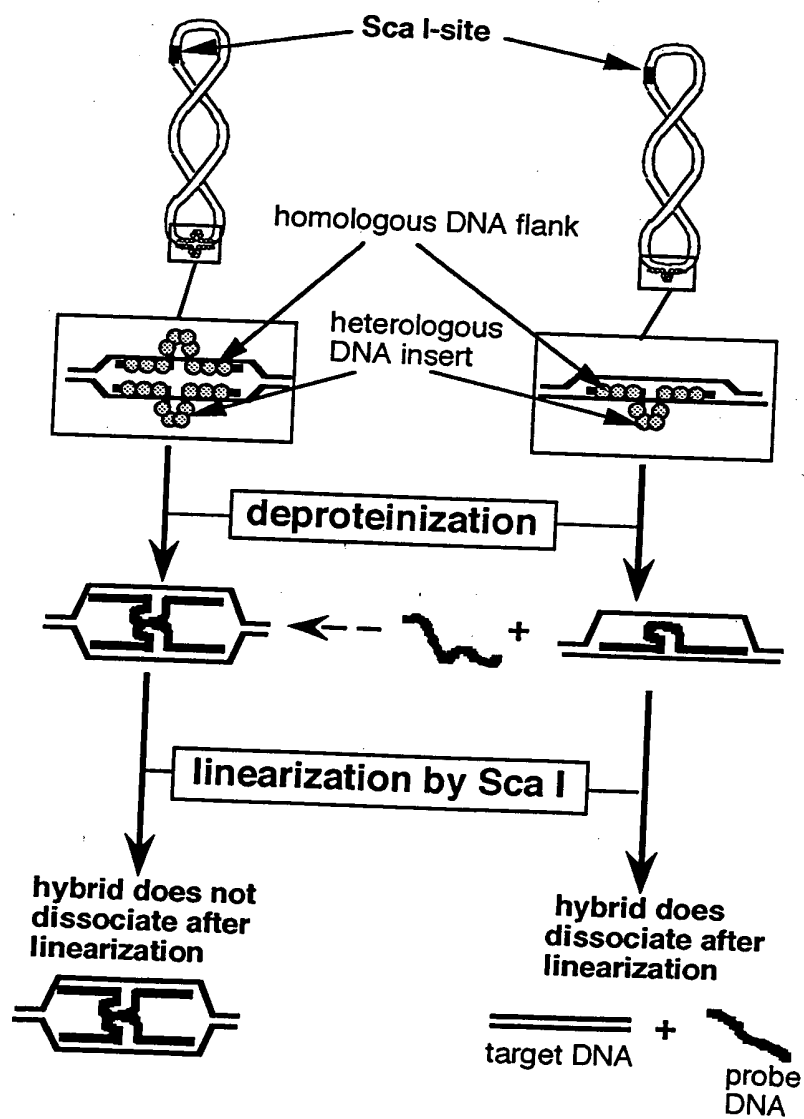
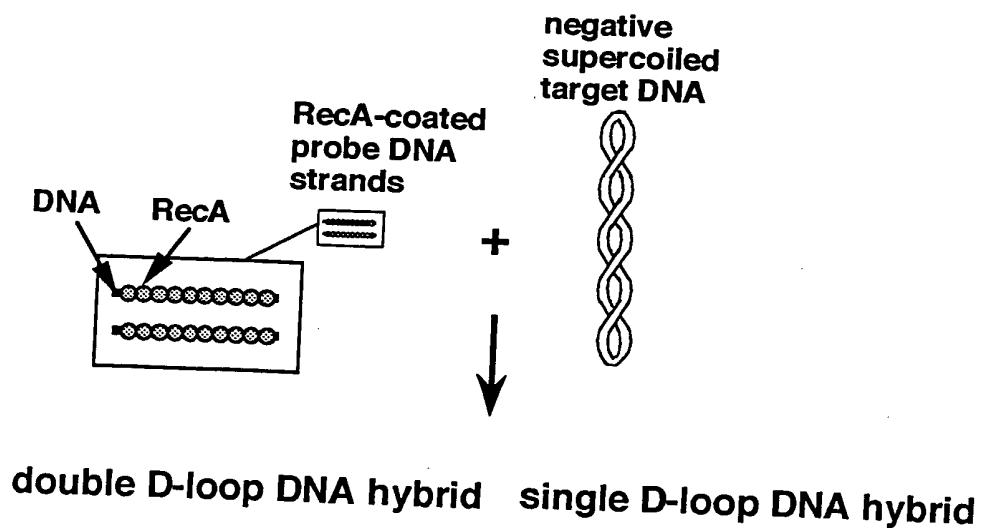
5' - CCTCGAGGTCGACGGTATCGATAAGCTTGAT **TGTGTGTGTGTGTGTGTGTGT** ATCGAATTCCTGCAGCCCGGGGGATCCACTA - 3' **ZI_w**
3' - GGAGCTCCAGCTGCCATAGCTATTCGAACTA **ACACACACACACACACACA** TAGCTTAAGGACGTCGGGCCCCCTAGGTGAT - b **ZI_c**

C.

5' - CCTCGAGGTCGACGGTATCGATAAGCTTGAT **TTGGGGTTGGGGTT** ATCGAATTCCTGCAGCCCGGGGGATCCACTA - 3' **QI_w**
3' - GGAGCTCCAGCTGCCATAGCTATTCGAACTA **TTGGGGTTGGGGTT** TAGCTTAAGGACGTCGGGCCCCCTAGGTGAT - b **QI_c**

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FIGURE 10



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FIGURE 11

+	+	-	-	+	+	+	+	second probe DNA strand	+	+	-	-	+	+	+	+
+	+	+	+	-	-	+	+	RecA protein	+	+	+	+	-	-	+	+
+	+	+	+	+	+	-	-	target homology	+	+	+	+	+	+	-	-
-	+	-	+	-	+	-	+	ScaI linearization	-	+	-	+	-	+	-	+
1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

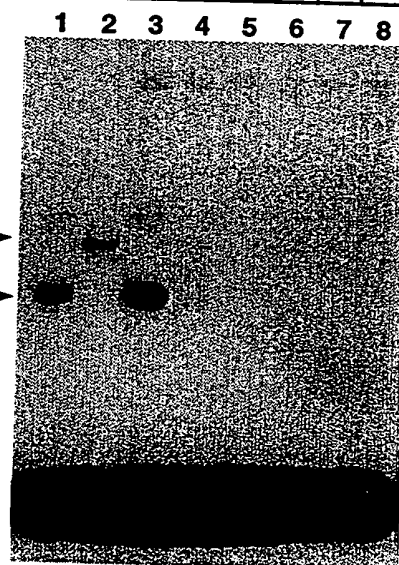
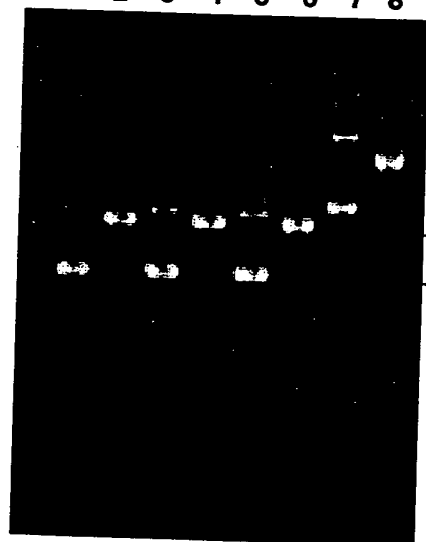
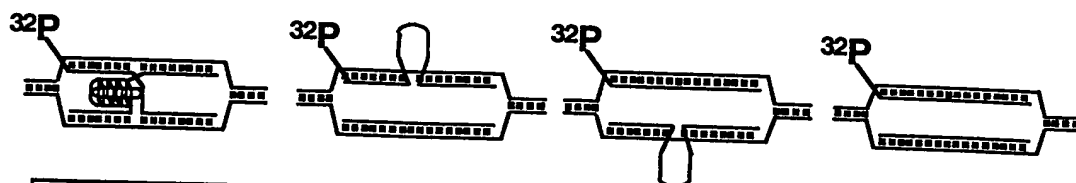


FIGURE 12

A.



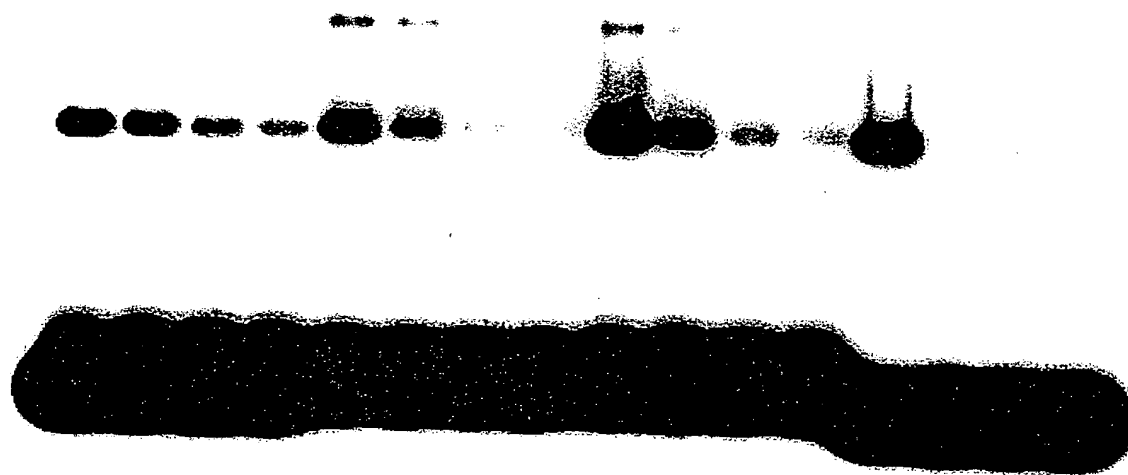
³² P-labeled probe strand unlabeled probe strand incubation at 65°C (min.) lane	QI _w				QI _w				NI _w				NI _w			
	QI _c				NI _c				QI _c				NI _c			
	0	2	10	20	0	2	10	20	0	2	10	20	0	2	10	20
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

origin



linear
hybrid →

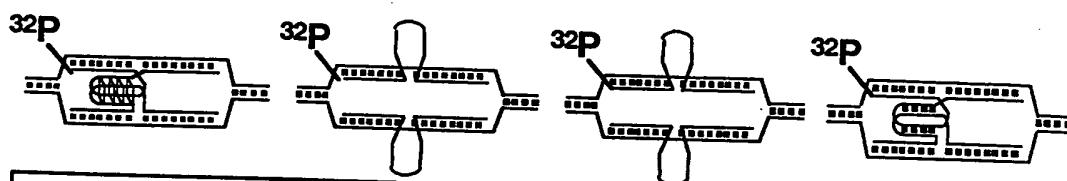
unincorporated
probe



007240" 2244560

FIGURE 12

B.



^{32}P -labeled probe strand	QI_w				QI_w				ZI_w				ZI_w			
unlabeled probe strand	QI_c				ZI_c				QI_c				ZI_c			
incubation at 65°C (min.)	0	2	10	20	0	2	10	20	0	2	10	20	0	2	10	20
lane	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

origin

--->

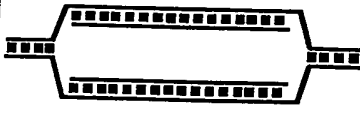
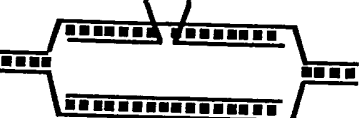

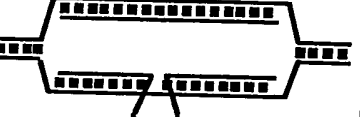
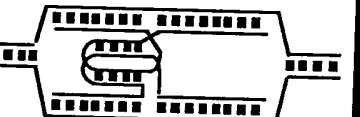
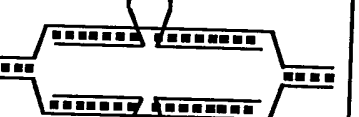
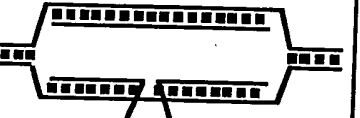
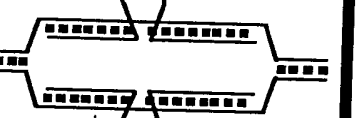
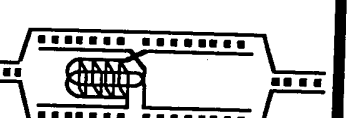
linear hybrid >

sc

unincorporated probe

007240 "E242560

FIGURE 13

<div>top probe strand</div> <div>bottom probe strand</div>	NI_w	ZI_w	QI_w
NI_c	 $\tau_{1/2} < 2$	 $\tau_{1/2} < 2$	 $\tau_{1/2} < 2$
ZI_c	 $\tau_{1/2} < 2$	 $10 \leq \tau_{1/2} < 20$	 $\tau_{1/2} < 2$
QI_c	 $\tau_{1/2} < 2$	 $\tau_{1/2} < 2$	 $5 \leq \tau_{1/2} < 10$

NI = No DNA Insert

ZI = Z-DNA forming Insert

QI = Quadruplex-DNA forming Insert

w = Watson DNA strand

c = Crick DNA strand

$\tau_{1/2}$ = double D-loop DNA hybrid apparent half-life time (min.)

007240" E242550

FIGURE 14

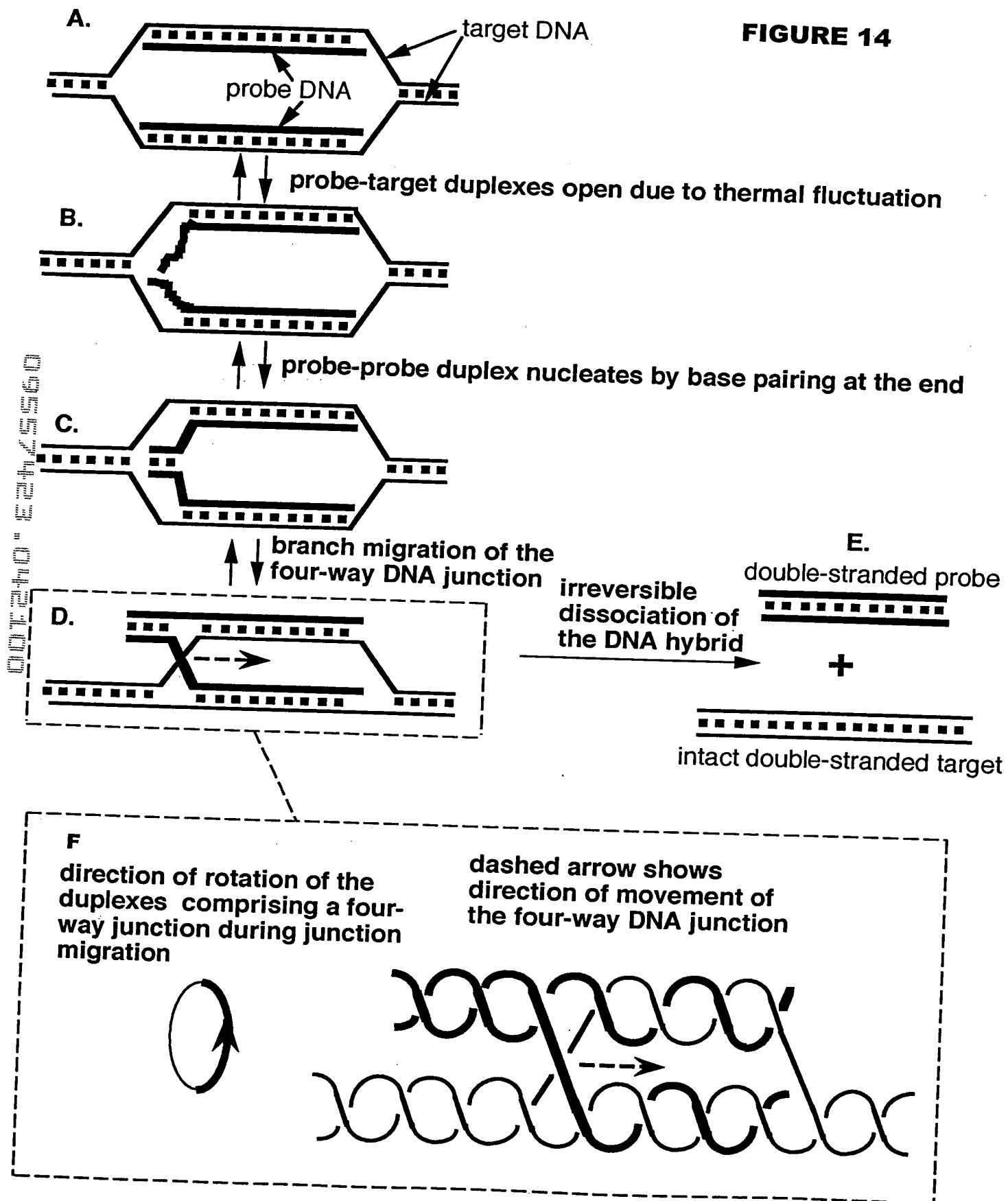


FIGURE 15

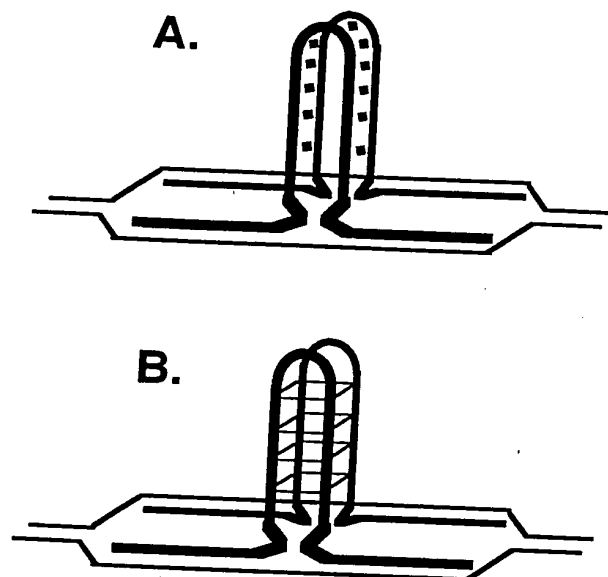


FIGURE 16

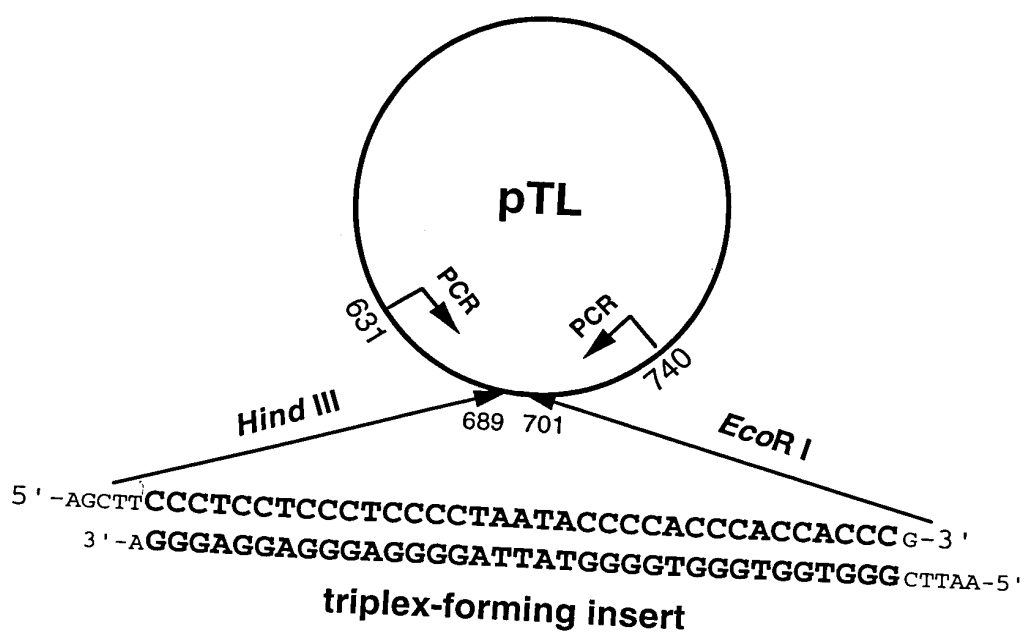
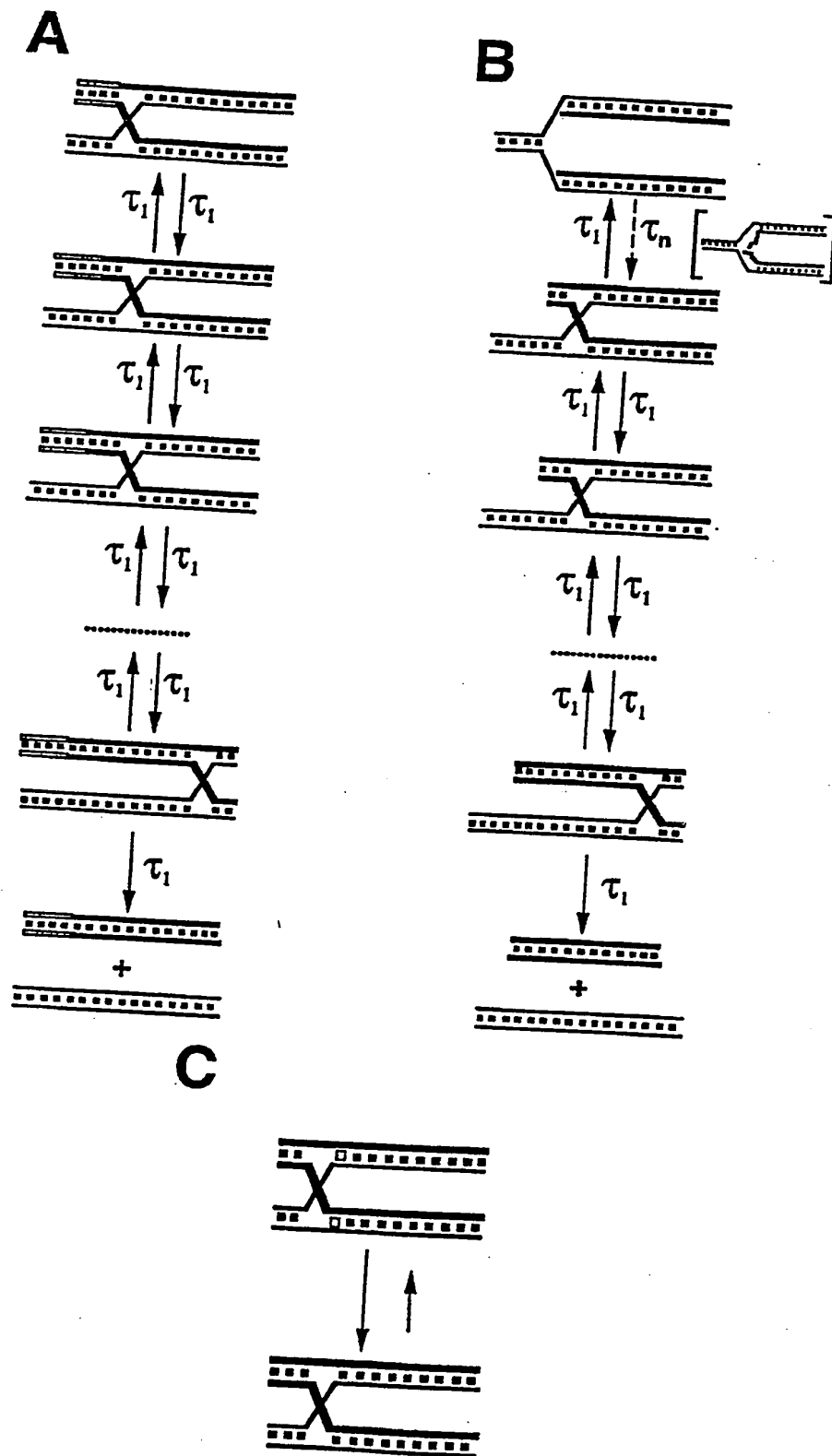


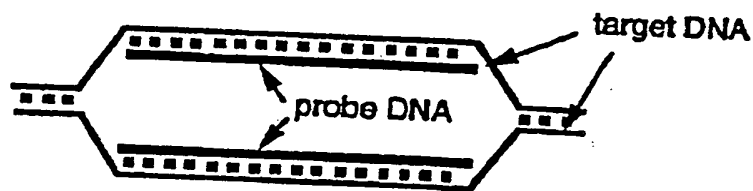
FIGURE 17



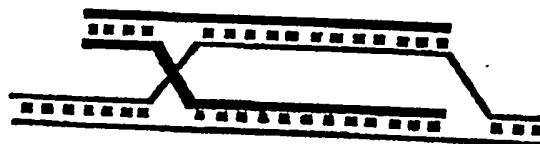
001240" E2425560

FIGURE 18

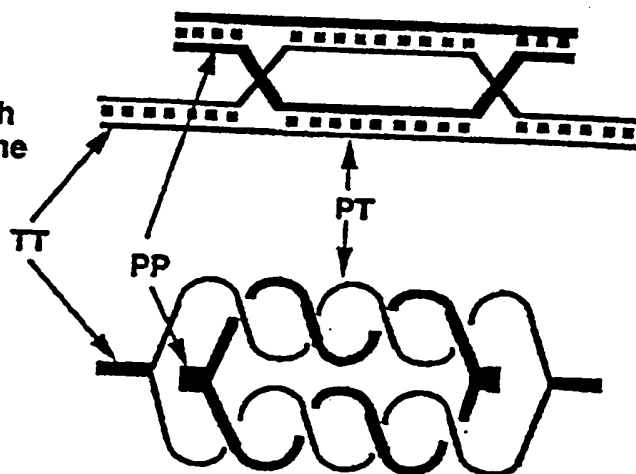
A: Double D-loop DNA without nucleation of the probe-probe duplex



B: Double D-loop DNA with single nucleation (sn) of the probe-probe duplex



C: Double D-loop DNA with double nucleation (dn) of the probe-probe duplex



TT = target-target DNA duplex

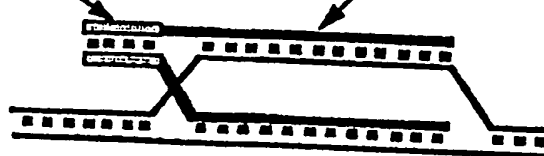
PP = probe-probe DNA duplex

PT = probe-target DNA duplex

probe DNA sequence
heterologous to target DNA

probe DNA sequence
homologous to target DNA

D: Double D-loop DNA with irreversible single nucleation of the probe-probe duplex at one end



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FIGURE 19

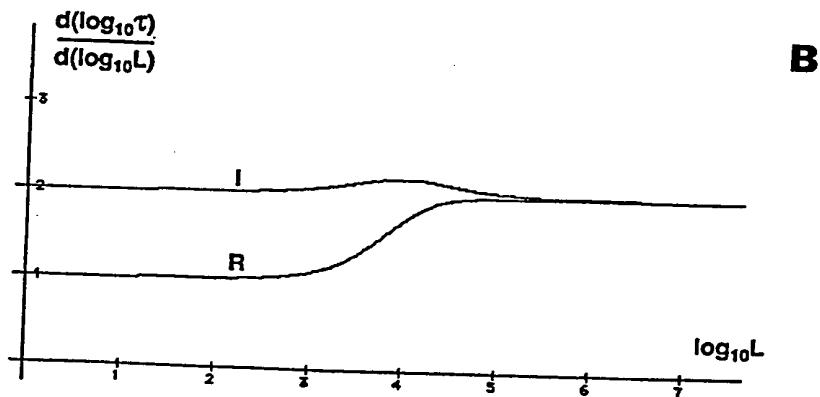
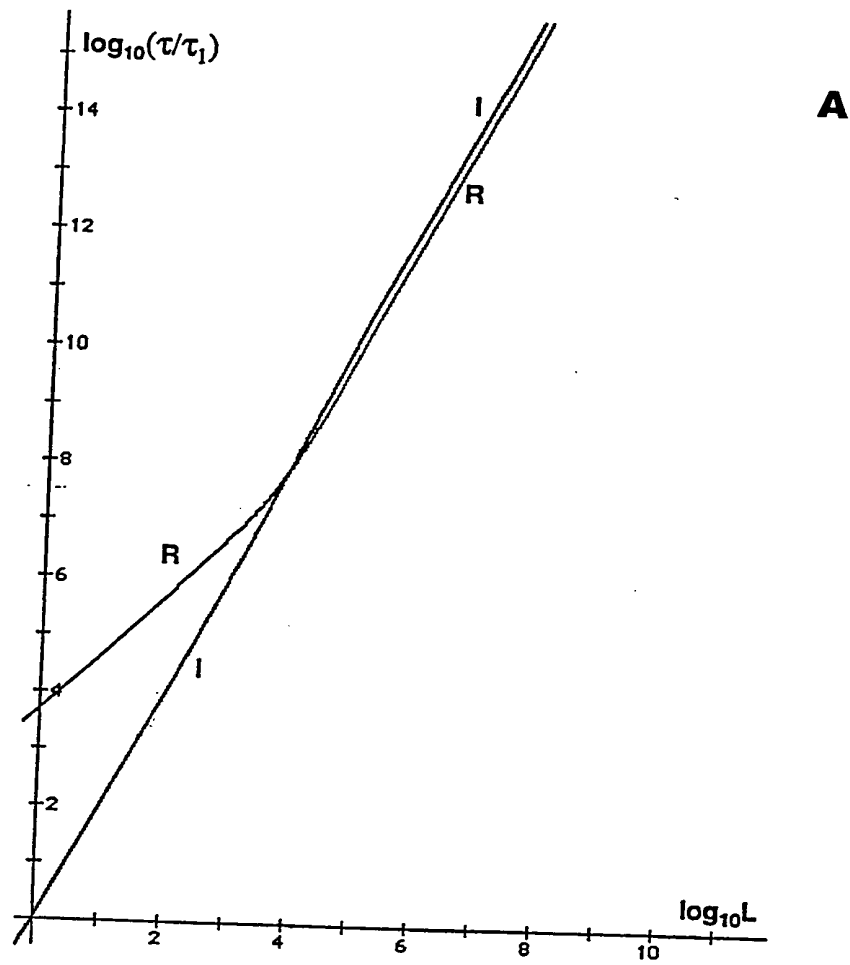
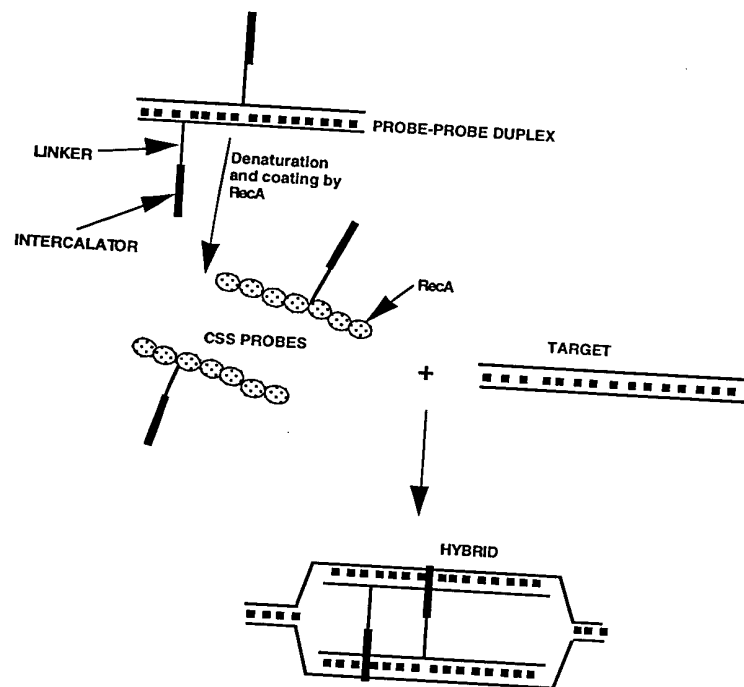


FIGURE 20



0957423 042100